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Friction, F, when the man is at top$=R'=\frac{3}{2}W\tan\phi$. When the man is at the bottom, the moment equation gives $R'.2l\cos\phi=Wl\sin\phi$. Whence $R'=\frac{1}{2}W\tan\phi$.

Hence, friction when at the top, is three times as great as when at the bottom.

Solved similarly by G. B. M. Zerr.

PROBLEMS FOR SOLUTION.

ALGEBRA.

331. **Proposed by G. B. M. ZERR, A. M., Ph. D., Philadelphia, Pa.**

Extract the square root of $21+6\sqrt{2}+2\sqrt{21}-6\sqrt{3}-6\sqrt{7}-2\sqrt{6}-2\sqrt{4}$ and also of $4\sqrt{2}+2\sqrt{6}-9-4\sqrt{3}$.

332. **Proposed by C. N. SCHMALL, New York City.**

Solve the quadratic, $x^2+ax+b=0$, without completing the square.

GEOMETRY.

359. **Proposed by W. J. GREENSTREET, M. A., Stroud, England.**

Two tangents are drawn to two confocal parabolas from any point on a common tangent. Show that the former two tangents and their chord of contact envelop yet another confocal parabola.

360. **Proposed by G. B. M. ZERR, A. M., Ph. D., Philadelphia, Pa.**

A circular segment, area A, revolves successively about the diameters (fixed) d, d', intersecting at an angle θ. If v=volume about d, v' the volume about d', then $v^2+v'^2-2vv'\cos\theta$ is independent of the position of the segment.

361. **Proposed by W. J. GREENSTREET, M. A., Stroud, England.**

$ABCD$ is a quadrilateral. The bisectors of A and C meet in O_1; those of B and D meet in O_2. Find the tangent of the angle between AD and O_1O_2 in terms of sines and cosines of A, D, $A+B$, and $A+D$.

CALCULUS.

389. **Proposed by G. W. DROKE, Professor of Mathematics, University of Arkansas.**

Find the curve such that the rectangle under the perpendiculars from two fixed points on the normals be constant.